EXPLANATION OF PLATE XII.

Fig. 1. Venation of *Helice pallidochrella* CHAMBERS.
" 2. " " *Cacelice permolestella* BUSCK.
" 3. " " *Eumeyrickia trimaculella* FITCH.
" 4. " " *Babaiaxa deliella* FERNALD.
" 5. " " *Holcocera maligemmella* MURTFELDT.
" 6. " " *Martyringa latipennis* WALSINGHAM.
" 7. " " *Mompha sexnotella* CHAMBERS.
" 8. " " (*Plutella*) *multimaculella* CHAMBERS.

TWO NEW GENERA OF BUNÆINE AFRICAN MOTHS.

BY A. S. PACKARD.

The two genera here proposed are founded on species heretofore referred to the genus *Nudaurelia*. This latter genus is an African one, and was originally separated by Rothschild from the Asiatic and Australian genus *Antheræa*, with which the species were by the older authors confounded. As regards the adult or imaginal stages the Bunæinæ of the Ethiopian realm are convergent types closely mimicking the genuine Saturniidæ. Their larvæ are very spiny, and their subterranean pupæ, with their large cremasters, are sphingicampid in form and structure.

Acanthocampa, gen. nov.

Saturnia WESTWOOD, Proc. Zool. Soc. London, 1849, p. 41.

Antheræa WALKER, Cat. Lep. Het. Br. Mus., v, p. 1241. 1855.

Nudaurelia ROTHSCHILD, Novitates Zool., p. 41. 1895; Sonthonnax, Annales Lab. d'Études Soie, x, p. 24, 1900–1901.

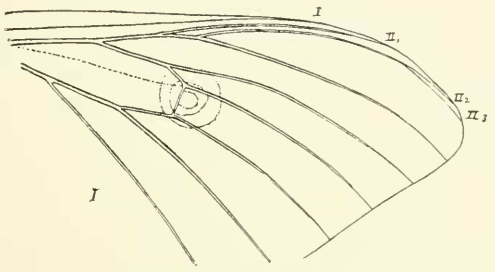
Imago.—♂ and ♀. Head in front moderately wide, narrowing slightly toward the palpi; squamation not shaggy as in *Thyella*, but moderately close. Palpi depressed, reaching beyond the front, though they are short and small; the terminal hairs are long and are confused with those of the face; end of the palpi rather broad, the hairs uneven, so that the third joint can not be distinguished; when denuded (Fig. 4) they are seen to be small, 3-jointed, the second joint nearly twice as long as the first, and the third button-shaped, no longer than thick. Antennæ of ♂ subplumose, with 35 joints; well bipectinated nearly to the subfiliform tip, of which only the last six joints bear minute vestigial pectinations; the other pectinations are long, slender, only a little shorter than in *Thyella*, with long dense ciliæ.* Antennæ of ♀

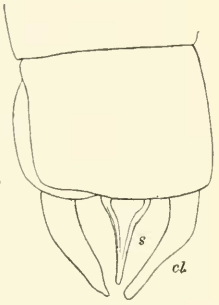
*"The male antennæ are 35-jointed with fifty-six rays on each side, the rays rather long; the two basal rays of each joint are obliquely porrected, so that the rays form four series instead of all being on the same plane" (Westwood).

with about 32 joints, subsimple, somewhat flattened, the longest branches two-thirds as long as the joints bearing them, and ending in two minute rather long setæ; the distal pectinations forming short stout teeth. Thorax moderately stout, not shaggy as in *Thyella;* there is a definite prothoracic collar.

Fore wings subfalcate, much as in *Thyella;* compared with those of *Thyella* very similar in shape, but differing in the costa being a little less arched or curved towards the apex, which is moderately acute, not so much so as in *Thyella;* outer edge slightly excavated; inner angle not so square as in *Thyella* and more rounded. Hind wings more rounded than in *Thyella;* the apex much more rounded; outer edge rounder, as is the inner angle. The abdomen reaches to the beginning on the inner edge of the hind wing of the extradiscal line.

FIG. 1. FIG. 2.





Acanthocampa belina. 1, venation of fore wing; 2, genitalia, dorsal view; *s*, suranal plate; *cl*, clasper.

Venation (Fig. 1): vein II 2 present, as in *Thyella;* origin of veins II 1–3 much as in *Thyella* but situated a little farther out, the chief difference in the venation is in vein III 2 being independent, *i. e.*, moved towards the middle of the extradiscal cell, so that the discal veins are very short, not much more than half as long as in *Thyella.* As will be seen by reference to the figures the venation is very different from that of *Nudaurelia.* The same features are also seen in the hind wings (Fig. 3), the discal veins being very short, though the general proportions of the discal cell itself are much the same in *Thyella* and *Nudaurelia.*

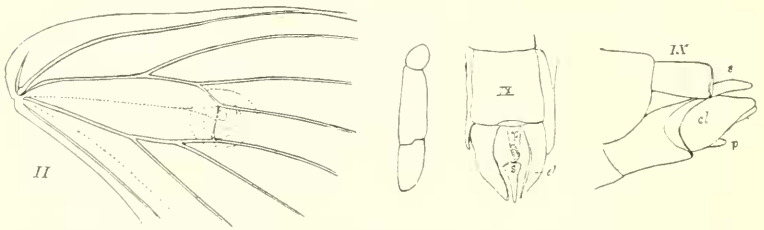
Markings: ground color obscure grayish-yellow or light fawn; the ocellus on the fore wing small, that on the hind wing about three times as large; the clear space being oval, that of the fore wings small, hemispherical, or rather semiovate, or half-egg-like in outline. The lines are white, the basal line inclined to be zigzag and the extradiscal slightly scalloped, but not nearly so much so as in *Thyella;* in general the arrangement of the lines are much as in *Nudaurelia cytherea.* Body and inner edge of the hind wings not so shaggy and woolly as in *Thyella.*

Fore tibial odoriferous sack is very different from that of *Thyella,* being short, about two thirds as long as the tibia itself, and as wide, oval-lanceolate, flattened, not sharp at the end.

The fore tibiæ are short and thick, with dense hairs entirely concealing the

odoriferous sack, but when denuded rather slender and only two thirds as long as in *Thyella*: they end dorsally in two slender spurs which are longer in the ♀ than in the ♂; these spurs are not so stout as in *Thyella*. Genitalia (Figs. 2, 5, 6) allied to those of *Thyella*, but the suranal plate is narrower, compressed, subcultriform,

FIG. 3. FIG. 4. FIG. 5. FIG. 6.



Acanthocampa belina. 3, venation of hind wing; 4, a palpus denuded; 5, genitalia, sternal view; *s*, suranal plate; *cl*, clasper; *p*, penis; 6, genitalia, side view; *s*, suranal plate; *cl*, clasper; *p*, penis.

while that of *Thyella* is broad and flat; the single pair of claspers are wide, but seen from above longer and slenderer than in *Thyella*. The penis is a cylindrical subacute process.

In its imaginal characters this genus agrees with *Thyella* in the shape of the front of the head, the palpi and especially the plumose antennæ with their long delicate densely ciliated branches, as well as in the shape and nature of the ocelli of each pair of wings; also in the ♂ genitalia. It differs decidedly from *Nudaurelia*, with which it has been associated, both in the antennæ and venation. The ♀ antennæ being subsimple, the species need not be confounded with those of *Antherina* and *Melanocera*, in which the ♀ antennæ are stated by Sonthonnax to be nearly as widely pectinated as in the male. Its divergence from *Thyella* is brought out in the preceding description.

Larva.—Generic characters. While the imago approaches *Thyella* in its most important characters, the larva is generically related to *Nudaurelia* (*N. dione* especially). It differs in the considerably shorter spines, which, however, are not curved as they are in that species. The dorsal spines of the thoracic and abdominal segments are all of the same length and size; the median dorsal spine of the eighth abdominal segment is more deeply divided than in *N. dione*. It differs also from *N. dione* in the presence of the numerous flattened fungoid warts, there being none present in that genus, so far as yet known.

The genus is represented by *A. belina* (Westwood) a not uncommon species in Natal (of which, according to Rothschild, *Antheræa*

huebneri Kirby is a synonym); and by *A. zambesina* (Walker) from Zanzibar. What is probably a third species is *Nudaurelia felderi* of Rothschild, from Bogos, Abyssinia. The wings of this species, he states, are "very similar to red varieties of *N. belina* (Westw.), but without the ocellus on the fore wings, there being only a small square vitreous spot. Another difference is the very broad white border to the ocelli of the hind wings." (Novitates Zoölogicæ, ii, p. 42, 1895.)

Larva of A. belina.—Last stage. Head about one half as wide as the body, slightly more than half as wide as the prothoracic segment; deep black, unarmed; surface with groups of from 1 to 8 microscopic granulations, arranged in irregular rows. Surface of the prothoracic plate rugose, unarmed, but bearing a number of long white hairs. In front of the prothoracic spiracle is a very low flattened tubercle not easy to detect, bearing about eight setiferous warts; lower down above the base of the leg is a low rounded tubercle about the size and shape of the one above, and bearing from 5 to 6 minute setiferous warts.

The body behind the prothoracic segment, including the 9th abdominal segment, is *armed with stout black spines, all of the same size*, which are inclined backwards, but *not curved*, being nearly straight and sharp, and from around the base arise about five long white radiating hairs, some nearly as large as the spine itself. The spines are rather short and small, but yet conspicuous (they are apparently longer than in *Nudaurelia dione* and *Thyella tyrrhea*).

The spines of the infraspiracular row are acute, black, and only about one half as large as those of the supraspiracular row. A series of still smaller ones along the base of the abdominal legs, becoming larger and more prominent on the legless abdominal segments 1, 2, 7 and 8.

The median horn on the 8th abdominal segment is *no longer than the other dorsal spines;* it is *very deeply cleft* (the largest), in one example much more so than in *N. dione;* in the smaller specimen (60 mm. in length) it is no more forked than in *N. dione*).

Suranal plate large, rounded on the hinder edge; the surface black, moderately convex and granulated, the microscopic granulations around the edge larger, with scattered very fine setæ. Anal legs large, black, subtriangular, with scattered warts.

Body above and beneath almost entirely covered with dense fungoid pearl-colored oval or polygonal warts, throwing off pearly reflections, and centered with a minute pit. These fungoid warts are more numerous and more crowded than in any other of the genera possessing them. Spiracles black. A reddish flesh-colored discoloration on each side of each thoracic segment, below where the spiracles should be if present, and below the prothoracic spiracle. Thoracic, middle abdominal and anal legs black. Length, 80 mm.

A Smaller One of Last Stage.—Length 60 mm. In the smallest of the three larvæ the median "horn" or spine is no more deeply cleft than in *N. dione*. That it is in the last stage is shown by the head being of the same size as in the others.

The fungoid warts are much less numerous. It also has more hairs arising from the spines, and they are inserted higher up from the base of the spine; also the spinules are reddish, but in the two other larvæ black.

For the opportunity of examining these and other larvæ, which are preserved in formaline and glycerine, so as to well retain the shape and colors, I am indebted to the generosity of Lieut. Col. J. M. Fawcett, of Carlisle, England, who has added so much to our knowledge of the Sphingicampid and Saturnian larvæ of southern Africa.

Aurivillius, gen. nov.

Saturnia WESTWOOD, Proc. Zool. Soc. London, March 27, 1849, p. 41.

Antheræa WALKER, Cat. Lep. Het. Brit. Mus., V; MAASSEN u. WEYMER, Beiträge zur Schmett., IV, fig. 59, 1881; KIRBY, Syn. Cat. Lep. Het., I, p. 756, 1892.

Nudaurelia ROTHSCHILD, Novitates Zoologicæ, II, p. 43, 1895; SONTHONNAX, Annales des Laboratoire d'Études de la Soie, X, p. 7, 1901.

This genus is dedicated to Professor Dr. Chr. Aurivillius, of Stockholm, who has added so much to our knowledge of the Lepidoptera of the Ethiopian realm. The type is *Nudaurelia arata* (Westwood); no other species is as yet known. It inhabits Natal.

Imago.—♂. Head smaller in front, not so broad as in *Nudaurelia cytherea*. Antennæ of male not so broadly pectinated; the tip with 7-8 joints, filiform, a little slenderer and the vestigial pectinations shorter than in *Nudaurelia*; the joints are rather long, slender and contracted at their base, especially those beyond the middle, where they are nearly three times as long as broad. Palpi stout, well developed, densely scaled, 3-jointed; when denuded they seem to be rather slender, the second joint nearly twice as long as the first, the third button-like, not quite so long as the second is thick.

Thorax moderately stout; vestiture moderately long; abdomen not very stout.

Fore wings somewhat more arched on the costal edge, and the apex more pointed than in *Nudaurelia cytherea*. Hind wings with the apex rounded; the outer edge moderately convex. Abdomen not extending to the outer third of the inner edge.

Venation: (Fig. 7) that of the fore wings differs entirely from the arrangement of the veins in *Nudaurelia cytherea*; in the place of origin of the first subcostal vein (II 1), which is situated at a point in front (towards the costa) of the end of the distal cell (in *Nudaurelia* it arises a little beyond the middle of the cell), it arises, moreover, a little more than half way between the origin of the common stalk of II 1, II 2, II 3, and II 4, and the stalk of veins II 1 and II 3. The two discal veins (discocellulars) form a rather short straight line; vein III 3 is partly detached, slightly more than in *Nudaurelia*. The venation of the hind wings is much as in *Nudaurelia*, with slight differences. Fig. 9.

Legs rather long, fore tibiæ rather long, the tarsi normal, well developed; tibial epiphysis of ♂ a little more than half as long as the tibia; oval-lanceolate, tip rather sharp; inner and outer surfaces clothed with a dense, very short pile; but along the outer edge a few large long scales. No spurs on fore tibiæ, but a short one on middle and hind tibiæ.

The male genitalia (Figs. 10, 11, 12, 13 and 14), present notable differences from those of *Nudaurelia*; the suranal plate is broad at base, but ends in a long

FIG. 7.

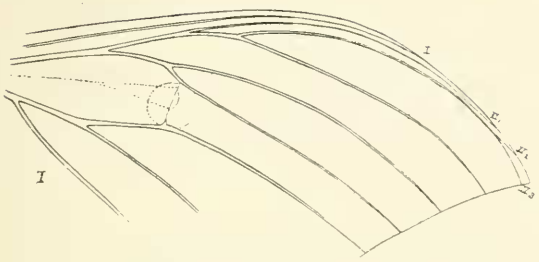


FIG. 8.

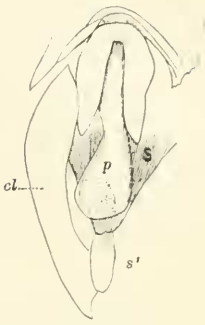


FIG. 9.

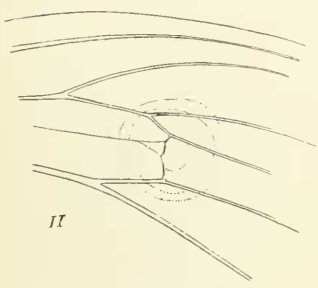


FIG. 10.

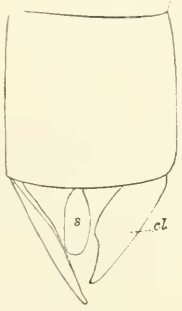


FIG. 11.

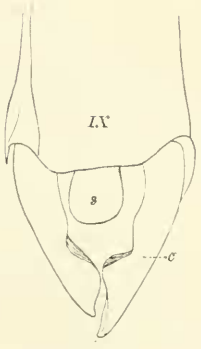


FIG. 12.

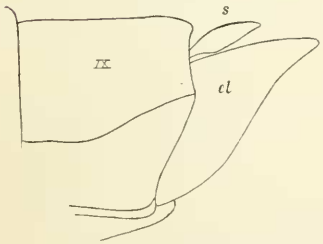


FIG. 13.

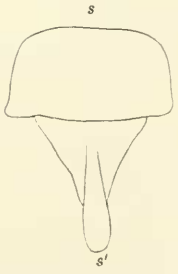
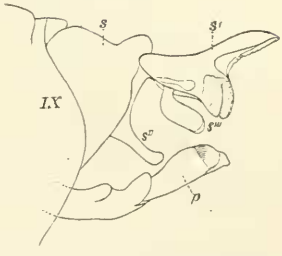


FIG. 14.



Aurivillius aratus. 7, venation of fore wing; 8, genitalia, ventral view with 9th abdominal segment removed; *cl*, clasper; *s*, suranal plate; *s'*, specialized extremity; *p*, penis; 9, venation of hind wing; 10, genitalia, dorsal view; *cl*, clasper; *s*, suranal plate; 11, genitalia, ventral view; *s*, suranal plate; *c*, clasper; 12, genitalia, side view; *s*, suranal plate; *cl*, clasper; 13, genitalia, dorsal view, with the last tergite removed; *s'*, specialized extremity; 14, genitalia, side view of suranal plate; *s*, suranal plate; *s'*, specialized extremity; s^{II}, process from base; s^{III}, a second process from beyond the base of suranal plate; *p*, penis.

(seen tergally) spatulate process, while that of *Nudaurelia* is scarcely longer than broad, and has no such prolongation, only a little knob; the claspers are longer, while the penis is very large and wide, ending in a wide lobe (seen tergally) and extends nearly to the end of the claspers.

The markings are in general similar to those of *Nudaurelia cytherea*, but the discal spot of the fore wings is much smaller, and less complete, the clear space minute; on the hind wings the discal spot forms a large red ocellus, the center piled with black scales.

Should the generic name here given have been preoccupied, it may be changed to *Euaurivillius*.

A REVISION OF THE NORTH AMERICAN SPECIES OF THE GENUS CHOREUTIS.

By W. D. KEARFOTT.

These exquisite little creatures with their wealth of silver and metallic scales have always been of more than ordinary interest to me, and when I had the good fortune to breed a long series last summer, the subsequent efforts to identify them aroused an additional interest in the literature on the subject, of which this paper is the result.

I took a number of my bred specimens to the National Museum and compared them with all of the North American and European species there but could find none that were the same as mine. I then forwarded a pair to Lord Walsingham and another pair to Mr. E. J. Meyrick. Their replies, which I quote below, indicated that my species might be new and also raised the question whether the true *hjerkandrella* Thunb., and its var. *pretiosana* Dup., which have so long been on our lists, really do occur in the United States.

The investigation of the latter question was considerably more than I had bargained for, and for a novice seemed like presumption so soon after the revision of this group by Dr. Dyar and Professor Fernald, in the Canadian Entomologist.

I was fortunately, however, in possession of a goodly number of specimens from widely separated parts of North America, and as a primary requisite I obtained from Drs. Staudinger and Bang-Hass long series of the European *hjerkandrella* and *pretiosana*, as well as all other available European species of this genus. I was rather alarmed to find that, while closely allied, none of the European forms compared